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Petroleum, Lubricants and their Related Products]



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Indian Standard
SPECIFICATION FOR
CALCIUM BASE EP GREASE

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Indian Standard

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Indian Standard

SPECIFICATION FOR CALCIUM BASE EP GREASE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 3 March 1986, after the draft finalized by the Lubricants and Related Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 Calcium EP grease is extensively used by the steel industry and other industries for lubrication. This standard is intended chiefly to cover the technical provisions relating to the supply of the calcium EP grease, and it does not include all the necessary provisions of a contract.

0.3 In the preparation of this standard considerable assistance has been derived from the Interplant Standard IPSS 1-09-009-78 which has been formulated with the active participation of all the steel plants and the established manufacturers of grease under the aegis of the ISI and Steel Authority of India Ltd.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for calcium EP grease suitable for heavily loaded bearings operating at temperature up to 65°C.

2. GRADES

2.1 The material shall be of the following two grades:

- a) Grade 1, and
- b) Grade 2.

*Rules for rounding off numerical values (revised).

3. REQUIREMENTS

3.1 General — The material shall be smooth and homogeneous and free from objectionable odour and visible impurities and shall possess good pumpability characteristics (*see* Appendix A). It shall be free from deleterious materials and fillers of any description and shall not show any signs of breakdown, hardening or tendency of the constituents to separate.

3.2 Composition — The material shall consist of the following ingredients:

- a) Refined mineral oil;
- b) A suitable calcium soap; and
- c) Anti-oxidants, anti-rust, extreme pressure and other necessary additives.

3.3 The material shall also comply with the requirements given in Table 1, when tested according to the methods given in col 5 and 6 of the table.

3.4 Keeping Quality — The material when stored in original sealed containers under normal temperature conditions in shade shall retain the properties described under 3 for a period of not less than one year after the date of delivery.

4. PACKING AND MARKING

4.1 Packing — The material shall be packed in metal or any other suitable containers as agreed to between the purchaser and the supplier.

4.2 Marking — The containers shall be securely closed and marked with the name of the manufacturer; name, type, grade and mass of the material; recognized trade-mark, if any; and identification in code or otherwise to enable the lot of consignment or manufacture to be traced back.

4.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

TABLE 1 REQUIREMENTS FOR CALCIUM EP GREASE

(Clause 3.3)

SL No.	CHARACTERISTIC	REQUIREMENT		METHOD OF TEST	
		Grade 1	Grade 2	Ref (P :) of IS : 1448*	to Appendix to This Standard
(1)	(2)	(3)	(4)	(5)	(6)
i)	Kinematic viscosity of mineral oil extracted from the grease at 100°C, cSt	13 to 16	13 to 16	P : 25	—
ii)	Viscosity index, <i>Min</i>	40	40	P : 56	—
iii)	Flash point, Cleveland (open) cup, °C, <i>Min</i>	177	177	P : 69	—
iv)	Penetration or consistency at 25.0° ± 0.5°C:			P : 60	—
	a) At 60 double strokes	310 to 340	265 to 295		
	b) At 10 000 double strokes	Shall not be more than 20 units from the penetration at 60 double strokes			
v)	Drop point, °C, <i>Min</i>	100	100	P : 52	—
vi)	Free organic acidity (as oleic acid), percent by mass	To be reported		P : 53	—
vii)	Free alkalinity [as Ca (OH ₂)], percent by mass	To be reported		P : 53	—
viii)	Sulphated ash, percent by mass, <i>Max</i>	5.0	5.0	P : 4	—
ix)	Low temperature pumping properties	Shall be easily pumpable		—	A
x)	Timken OK load, kg, <i>Min</i> (see Note 1)	18	18	P : †	—
xi)	Copper strip corrosion at 75°C for 24 h	Negative	Negative	P : 51	—
xii)	Resistance to water washout, percent loss by mass, at 40°C, <i>Max</i>	5	5	P : 90	—
xiii)	Oxidation stability (100 hours), drop in pressure, kgf/cm ² , at 65°C, <i>Max</i> (see Note 1)	1.0	1.0	P : 94	—
xiv)	Roll stability change in consistency in 16 hours, percent, <i>Max</i> (see Note 1)	25	25	P : †	—

(Continued)

TABLE 1 REQUIREMENTS FOR CALCIUM EP GREASE — *Contd*

Sl. No.	CHARACTERISTIC	REQUIREMENT		METHOD OF TEST	
		Grade 1	Grade 2	Ref (P :) of IS : 1448*	to Appendix of This Standard
(1)	(2)	(3)	(4)	(5)	(6)
xv)	Leakage and deposit forming tendencies (wheel bearing test) (<i>see</i> Note 1)			P : §	—
	a) Leakage by mass at 65°C for 3 hours, <i>Max</i>	10 g	10 g		
	b) Deposit in the wheel bearing races or the rollers	Shall be free from deposits			
	c) Evidence of abnormal changes in the consistency of structure of the material	Not limited, but observations are to be reported			
	d) Indication of dry running of races	do			
xvi)	Plastic abrasion test, number of scratches, <i>Max</i>	10	10	P : ¶	—
xvii)	Heat stability at $95 \pm 1^\circ\text{C}$ (<i>see</i> Note 2)	No sign of breakdown of marked change in consistency or separation of oil		P : 62 (Method A)	—
xviii)	Water content, percent by mass, <i>Max</i>	1.0	1.0	P : 40	—
xix)	Emcor rust test, <i>Max</i> (<i>see</i> Note 1)	Rating O	Rating O	P : ¶	—

NOTE 1 — These are type tests for which manufacturers/suppliers shall give the guarantee for their compliance.

NOTE 2 — For defence requirements this test may be carried out at $120 \pm 1^\circ\text{C}$.

*Methods of test for petroleum and its products.

†Under preparation. Till such time ASTM D 2509-77 may be followed.

‡Under preparation. Till such time ASTM D 1831-64 (Reapproved 1973) may be followed.

§Under preparation. Till such time ASTM D 1263-61 (Reapproved 1973) may be followed.

¶Under preparation. Till such time ASTM D 1404-64 (Reapproved 1973) may be followed.

¶¶Under preparation. Till such time IP 220/78 may be followed.

5. SAMPLING

5.1 Representative samples of the material shall be drawn as prescribed in IS : 1447-1966*.

5.2 Number of Tests — Individual containers selected according to IS : 1447-1966* shall be opened and examined for the general requirements given in **3.1**. Tests for consistency, free organic acidity and free alkalinity shall be done on individual samples. Tests for copper strip corrosion shall be conducted on two of the individual samples.

5.2.1 Tests for all the remaining characteristics shall be done on the composite sample prepared by mixing small portions from individual containers selected in the sample.

5.3 Criteria for Conformity — The lot shall be declared acceptable only if each of the test results obtained under **5.2** and **5.2.1** satisfies the relevant requirements.

A P P E N D I X A

[*Clause 3.1 and Table 1, Sl No. (ix)*]

DETERMINATION OF LOW TEMPERATURE PUMPING PROPERTIES

A-1. APPARATUS

A-1.1 Grease Gun — Push type (*see* IS : 7794-1975†).

A-1.2 Refrigerator — Capable of being maintained at $-18^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

A-2. PROCEDURE

A-2.1 Fill the gun with grease and place in a refrigerator at -18°C .

A-2.2 Maintain at the test temperature for 24 hours.

A-2.3 Remove the gun from the refrigerator and operate it immediately (*see* Note).

NOTE — Protective gloves should be worn during the test.

*Methods of sampling of petroleum and its products.

†Specification for manual portable grease guns.

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